

Research on the Innovative Development of Vocational Education Informatization in Ethnic Minority Areas under the Background of "Blockchain + Education"

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Abstract:

In the stage of educational informatization 2.0, new forms such as online learning, immersed learning and seamless learning in the intelligent and open education environment reflect the autonomy, intelligence and diversification of educational service subjects. Blockchain technology is gradually playing an important role in education and teaching in terms of top-level design sharing, accommodation of learning environment, independent construction of resources and reform of learning performance evaluation. Through the research on big data of Vocational Education in ethnic minority areas, build a health education ecosystem dedicated to vocational skilled talents, promote the sharing of vocational education resources and cultivate innovative skilled talents, and build high-level vocational schools, high-level vocational professional groups and high-level professional production and education integration bases, Form an information-based innovative teaching system of vocational education with regional characteristics to promote the development of Vocational Education in ethnic minority areas of Guangxi.

Keywords: *Blockchain technology, Ethnic areas, Vocational education informatization, Characteristic development.*

I. INTRODUCTION

In recent years, under the guidance and promotion of the United Nations, the European Union and other international organizations, various countries have successively issued a series of policy documents on blockchain, and in-depth exploration of blockchain technology and its application has become one of the research hotspots. The front page article of the people's daily on February 18, 2019 clearly pointed out that blockchain is a "new generation of information technology". With the characteristics of decentralization, security and data can't be tampered with, blockchain is considered to be one of the most potential technologies for reconstructing education in the 21st century and is widely used in the field of finance, which requires high trust, it has aroused the research interest and attention of educators. With the continuous promotion of information technology, the traditional education environment continues to turn

to the open education environment. With the intelligence and refinement of technology, the openness and adaptability of the open education environment are gradually improving. The application of blockchain technology in education and teaching is constantly advancing in terms of top-level design sharing, accommodation of learning environment, independent construction of resources and reform of learning performance evaluation. Especially after entering the stage of educational informatization 2.0, new forms such as online learning, immersed learning and seamless learning in intelligent and open education environment, it is realizing the autonomy, intelligence and diversification of educational service subjects. More and more schools, training and education institutions have begun to break through their own boundaries and seek Cross School, school enterprise and cross-border cooperation, which has promoted the application of blockchain technology into learning space, resource sharing, data processing, performance analysis, credit certification, talent training and so on to a greater extent. The State Council issued the implementation plan of national vocational education reform in January 2019 and the regulations of Guangxi Zhuang Autonomous Region on the promotion of ethnic education on January 1, 2019 are the opinions of the State Ethnic Affairs Commission and the Ministry of education on accelerating the reform and development of Vocational Education in ethnic minorities and ethnic minority areas, Promoting the innovative development of vocational education informatization is the fundamental transformation of vocational education and teaching reform in ethnic minority areas. Guangxi is the only national pilot area for comprehensive reform of Vocational Education in ethnic minority areas in China. Through the construction of high-level vocational schools, high-level vocational professional groups and high-level professional production and education integration base, Guangxi has formed an information-based innovative teaching system of vocational education with regional characteristics, and promoted the characteristic development of Vocational Education in ethnic minority areas in Guangxi [1].

II. RESEARCH SIGNIFICANCE

1) Use blockchain technology to obtain education data and learning information data in ethnic minority areas, and carry out research on big data of Vocational Education in ethnic minority areas. Using blockchain technology, a single node can be connected and the scattered information can be unified, It can promote institutions in vocational education The transfer of data between (vocational colleges, enterprises, factories, governments, etc.) breaks the traditional way of inherent single data source, helps schools share students' education data and learning information data, improves the utilization of data resources, and establishes a highly trusted bridge between students and employers, so as to integrate and grow the data between various institutions in the field of vocational education The research on big data of vocational education will be carried out step by step.

2) Develop certificate verification system and build a health education ecosystem for vocational skilled talents. The development of certificate verification system in the field of vocational education has strong pertinence to the target population. This system can provide corresponding talent information for enterprises and factories without communication through a third-party organization. As long as both parties allow their own information pairing and sharing, it can promote the matching between the demand

side and the supply side. The security of blockchain technology can ensure that information is not leaked, so as to optimize resource allocation and balance the vocational education ecosystem [2].

3) Use blockchain technology to innovate traditional online education and promote the sharing of vocational education resources. Blockchain technology has a good sharing mechanism, which is very in line with the characteristics of online education. It can realize the co construction and sharing of high-quality vocational education course, practice cases, experimental platforms, books and teaching materials online, so as to provide convenience for the majority of learners. Through the online education platform, learners can learn and practice repeatedly. At each node of the blockchain, online course instructors and learners from all parties can provide guidance and help.

4) Set up blockchain application technology course in vocational colleges to cultivate innovative skilled talents. At present, the blockchain market is developing rapidly and there is a huge shortage of talents engaged in blockchain related work. Blockchain application technology courses or majors are set up in vocational education to promote industrial innovation with talent training and urge talent training with industrial innovation. A large number of talents are engaged in blockchain work, so as to supplement the needs of major industries, including vocational education industry, Promote the innovative development of vocational education with information technology [3].

III. RESEARCH STATUS AT HOME AND ABROAD

3.1 Domestic Research Status

In October 2016, China released the white paper on China's blockchain technology and application development, which pointed out that blockchain has the characteristics of "transparency and data can't be tampered, which is of great value to the healthy development of education and employment". Subsequently, in the education informatization 2.0 action plan released in April 2018, it was clearly proposed to actively explore "effective ways such as intelligent learning effect, recording, transfer, exchange and certification" based on blockchain technology, and deeply integrate technology into education and teaching. Domestic research is mainly reflected in the construction of digital education resources based on blockchain, file management, learning data storage and tracking, intelligent learning robot design, etc. Li Xin and others proposed to build a new ecology of open educational resources based on blockchain technology, Quan lixin and others explored the application of blockchain in educational resources, and Liu Fengyuan and Yin Tingting explored the modeling and framework construction of educational resource sharing based on blockchain; Zhang Qian proposed a credit investigation management platform for college students' files based on blockchain; Yang Bing and Li Fengying proposed blockchain based learning experience data storage and identity authentication; Fang Haiguang and others discussed the application of blockchain to intelligent learning robot. China's first big data education blockchain test area - Beijing Tianjin Hebei big data education blockchain test area was established in 2018. Relevant education departments in Beijing, Tianjin and Hebei will cooperate with some enterprises to establish a big data platform for collecting and

recording students' learning and development data, and through the characteristics of blockchain, such as distribution, can't be tampered and traceability, Create a personalized learning and growth environment for students. Tsinghua X-lab, together with experts from several departments of Tsinghua University, has prepared to establish the "Ivy League", which proposes to innovate education through blockchain technology, protect intellectual property rights, gather high-quality courses and teachers on the blockchain, and fully promote resource sharing and talent training in Colleges and universities [4].

3.2 Research Status Abroad

In recent years, the surge in the application of blockchain technology has benefited from the promotion and guidance of relevant policies of the world organization and countries. In September 2016, the organization for economic cooperation and development (OECD) released the 2016 science and technology innovation outlook report, which listed blockchain technology as one of the top ten future technology development trends and proposed that it has significant potential application value. The EU released the report blockchain in education in 2017 (blockchain Education) introduces the basic principles of blockchain in educational application, and based on the development and deployment of technology, puts forward eight schemes for the application of blockchain technology in education. The American higher education informatization Association released the horizon report (2019 Higher Education Edition) in April 2019, which first put forward the trend and trend of "modularization and decomposition of degrees" "Blockchain technology" promotes the development of higher education. In addition to certificate management, learning evaluation and identity authentication, blockchain also makes some specific exploration in the creation of a secure learning environment, tuition and credit transfer, digital guardianship consent, competition and copyright management, lifelong learning and other aspects. Bdiwi et al. Introduced ubiquitous learning (U-Learning) system, which uses blockchain technology to provide learners with an environment for collaborative learning anytime, anywhere, with a high safety factor. The application of blockchain in digital guardianship consent helps to change the traditional way of collecting parental consent authority. Shlok et al. proposed a framework that allows public schools to grant the right to authorize third-party institutions without having to does it every time Contact with learners only with the consent of parents. In recent years, some researchers have proposed that the virtual currency generated based on blockchain technology can motivate students, so as to improve learners' interaction in online learning and improve learning efficiency and quality. Alexan-der et al. proposed a "learner centered" ecosystem, which can customize personalized education plans for learners and formulate a complete career track, so as to effectively promote lifelong learning. The United States is the richest in the creation of blockchain combined education platform. Learning machine, an American enterprise that has joined hands with MIT to create the famous Blockcerts platform, has also built blockchain diploma certification systems for other universities in the United States and some countries such as Malta and Australia. Blockchain enterprises such as IBM, Sony and Bitproof also actively cooperate with universities in various countries to innovate the construction and application of blockchain education application platform. Research on blockchain application platforms in the field of education in Asia is more diversified, involving language level certification, early childhood education, etc. to explore the application ways and values of the

construction of blockchain platforms [5].

IV. RESEARCH CONTENT

Deeply investigate the current situation of vocational education informatization development in ethnic minority areas, explore the development direction of "blockchain + education", study the lifelong learning and credit banking system for the cooperative development of vocational education schools and enterprises, the reform of vocational education rules and regulations and the construction of Vocational Education Informatization in Ethnic Minority Areas, and focus on the existing problems from the joint development of schools and enterprises, collaborative innovation Put forward countermeasures from the perspective of integrating the application of blockchain technology in education. The overall framework of the research is shown in Fig 1:

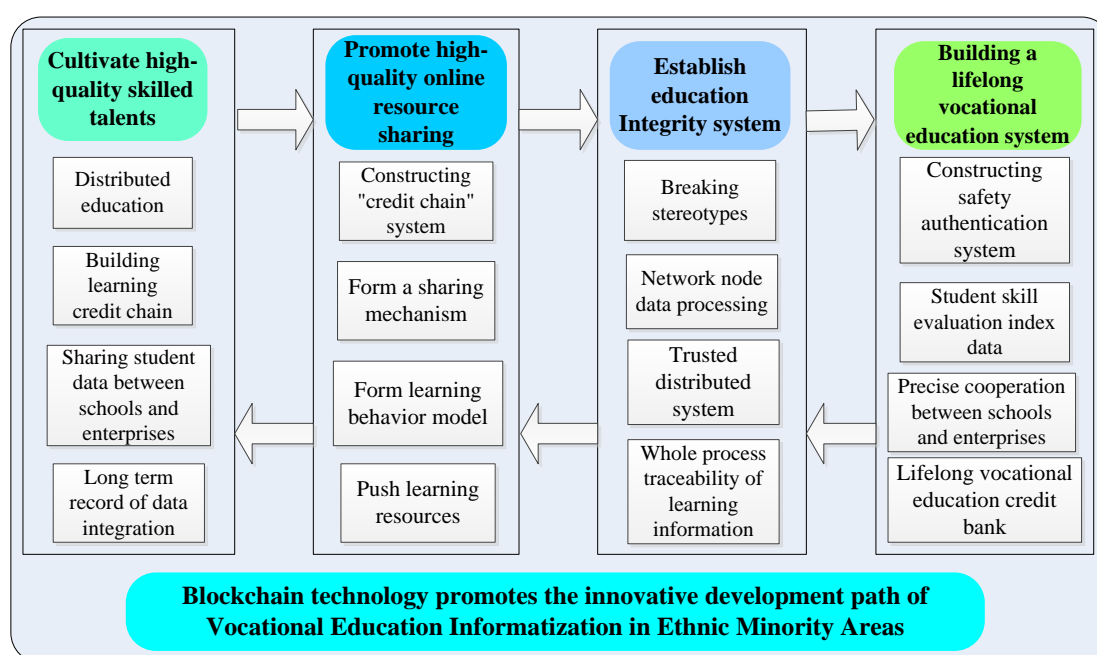


Fig 1: Overall block diagram of research on informatization innovation and development of Vocational Education in ethnic minority areas under the background of "blockchain + education"

4.1. Break Through the Development Obstacles of "Integration of Industry and Education, School Enterprise Cooperation and Combination of Work and Study" and Cultivate High-Quality Skilled Talents.

Using the distributed and point-to-point transmission technology of blockchain technology, Promoting cooperation among institutions in Vocational Education The data flow between (vocational colleges, enterprises, factories, governments, etc.) changes the traditional way of inherent single data source, constructs a system that helps schools share students' education data and learning information data,

improves the utilization of data resources, and establishes a highly trusted bridge between students and employers, so as to integrate the data between institutions in the field of vocational education The bank's integration and long-term record will help cultivate high-quality skilled talents urgently needed in various industries.

4.2. Change the Disorder of Online Education and Promote the Sharing of High-Quality Online Curriculum Resources in Vocational Education.

According to the tamper proof, decentralized and traceable characteristics of blockchain, build a "credit chain" ecosystem, form a sharing mechanism among schools, students and online education platform, apply blockchain technology to analyze learning behavior information with big data, form a general learning behavior model for learners, and push learning resources by quantifying learners' behavior, Make the selection of online learning platform more scientific [6].

4.3. Abandon the Old Rules and Regulations of Vocational Education and Establish an Educational Integrity System.

Based on distributed structure and distributed ledger technology, blockchain technology can complete the process of data bookkeeping, verification, storage, maintenance and transmission, form a consensus on authentication and principles according to all nodes in the network, form a trusted decentralized distributed system, effectively eliminate educational dishonesty, and establish an objective evaluation system and integrity management platform.

4.4. Reform the Traditional form of Education and Build a Lifelong Vocational Education System.

Blockchain technology is used to build an identification and certification system with permanent data storage, security, tamper proof, authenticity, traceability and verifiability, and store academic degrees and various learning certificates in the blockchain database to ensure the authenticity of certificates. Blockchain asymmetric algorithm, consensus mechanism, time series data and other technical advantages effectively solve the technical means and social trust problems of credit bank, making it possible for lifelong vocational education credit bank [7].

V. RESEARCH IDEAS AND RESEARCH METHODS

5.1 Research Ideas and Technical Roadmap

Based on the development status and existing problems of Vocational Education Informatization in ethnic minority areas, focusing on the four ways of promoting blockchain technology, taking the school enterprise cooperative development, the reform of vocational education rules and regulations and the lifelong learning and credit banking system constructed by vocational education informatization as the

research object, the research object is reformed and innovated by using blockchain technology, so as to promote the development of Vocational and technical education and establish and improve the vocational education talent training system in ethnic minority areas based on "blockchain + education". This study is divided into four stages. Research ideas and technical roadmap are shown in Fig 2:

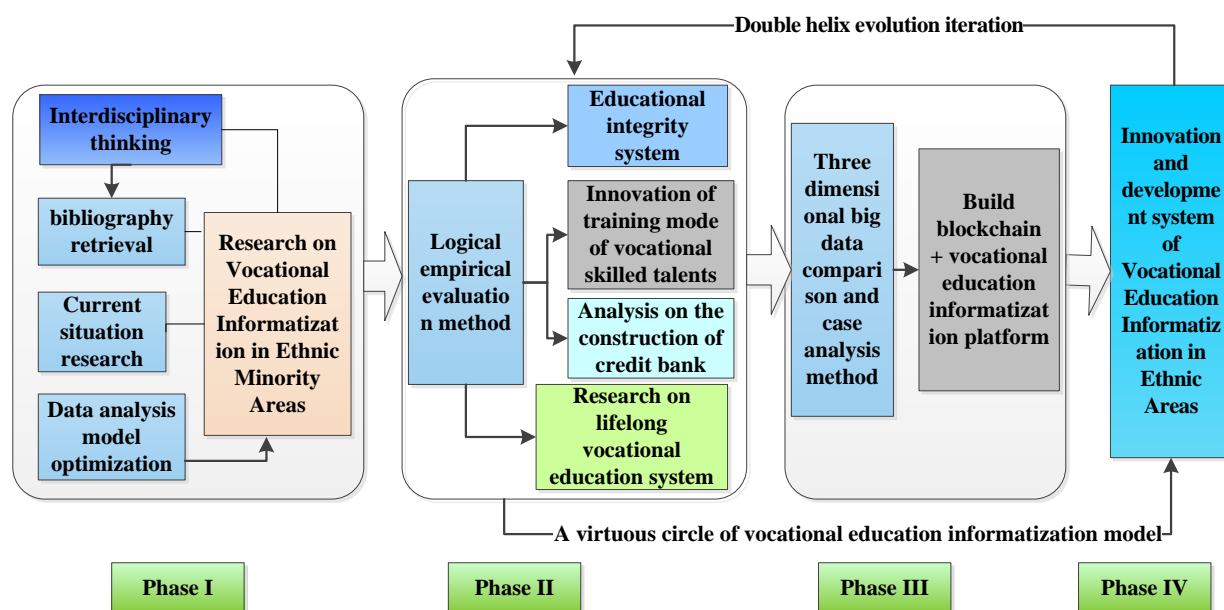


Fig 2: Research ideas and technical roadmap

5.2 The Research Methods are as Follows:

1) Literature analysis and research method: use the literature research method to analyze and study the development status and existing problems of Vocational Education Informatization in ethnic minority areas, understand the existing research results, development trends and deficiencies, and clarify the research content of this subject.

2) Questionnaire survey method: use the questionnaire survey method to investigate and study the development status and existing problems of Vocational Education Informatization in ethnic minority areas, teachers' educational information literacy, and the construction of Vocational Education Credit Bank supported by blockchain technology, so as to collect and sort out first-hand materials and prepare for data analysis.

3) Three dimensional big data comparison and case analysis method: use three-dimensional big data and case analysis method to study the school enterprise cooperative development, the reform of vocational education rules and regulations and the lifelong learning and credit banking system of vocational education informatization under the support of blockchain technology, so as to build a blockchain + vocational education informatization platform, Form an innovative development system of Vocational Education

Informatization in ethnic minority areas [8].

4) Mathematical modeling and logical empirical evaluation and analysis method: the logical empirical evaluation and analysis method is used to analyze the school enterprise cooperative development, the reform of vocational education rules and regulations and the lifelong learning and credit banking system constructed by vocational education informatization under the support of blockchain technology, so as to provide an important basis for revealing the law of vocational education informatization and creating a model.

VI. CONCLUSION

The application of blockchain technology and intelligent technologies such as big data, cloud computing and 5g in education is not independent, but integrated, innovative and complementary. Blockchain must continuously integrate with the new generation of intelligent technology and form a technology ecological chain, so as to promote future education to enter the intelligent stage based on "intelligent chain". The development of blockchain technology is gradually entering the 3.0 stage of full outbreak of application scenarios. The development of blockchain requires a large number of professionals, who should not only understand professional technology, but also understand management and adapt to the development of new business formats. To promote occupation education development, we need to strengthen the construction of talent team, establish and perfect the talent training system, create various forms of high-level personnel training platform, cultivate a number of leading figures and high-level innovation teams, and promote the Internet plus education application demonstration and the application scenario of "Ai + education" in the education department. We need to deeply explore the innovative application scenarios of "blockchain + education" to promote the innovative development of vocational education informatization.

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